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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/716,346

11/18/2003

Ming Zheng

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EXAMINER

FORMAN, BETTY J

ART UNIT

PAPER NUMBER

1634

MAIL DATE

DELIVERY MODE

08/02/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/716,346

Applicant(s)

ZHENG ET AL.

Examiner

BJ Forman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 and 27 is/are pending in the application.
- 4a) Of the above claim(s) 1-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-24 and 27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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FINAL ACTION

Status of the Claims

1. This action is in response to papers filed 12 June 2007 in which a Terminal Disclaimer was submitted and claims 21-24, 27 were amended. All of the amendments have been thoroughly reviewed and entered.

The previous rejections in the Office Action dated 30 January 2007 are withdrawn in view of the Terminal Disclaimer and amendments.

Applicant's arguments have been thoroughly reviewed but are deemed moot in view of the amendments, withdrawn rejections and new grounds for rejection. New grounds for rejection, necessitated by the amendments, are discussed.

Claims 21-24, 27 are under prosecution.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 21-23, 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Matyshevska et al (Mat. Sci. Eng. C, August, 2001, 15:249-252).

Regarding Claim 21, Matyshevska et al disclose a complex comprising unfunctionalized carbon nanotubes and single stranded nucleic acid (i.e. unwrapped double helix) wherein the complex is dispersed in solution prior to droplet deposition (page 249, last paragraph and Abstract). The solution composition prior to deposition is encompassed by the claimed

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dispersion. Furthermore, the “unwrapped double helix” is deemed single stranded based on the detected hyperchromatic effect observed in the presence of NaOH and CNT (page 250, left column).

Regarding Claim 22, Matyshevska et al disclose the complex wherein the nucleic acid is DNA (Abstract).

Regarding Claim 23, Matyshevska et al disclose the complex wherein the nucleic acid is synthetic and/or isolated from nature (page 249, last paragraph).

Regarding Claim 27, Matyshevska et al disclose the complex wherein the nucleic acid is metalized (i.e. Pt/Ir tip-DNA, page 251, right column).

4. Claims 21-24, 27 are rejected under 35 U.S.C. 102(a) as being anticipated by Buzaneva et al (Mat. Sci. Eng. C, January 2002, 19:41-45).

Regarding Claim 21, Buzaneva et al disclose a complex comprising unfunctionalized carbon nanotubes and single stranded nucleic acid (i.e. unwrapped double helix) wherein the complex is dispersed in solution prior to droplet deposition (page 42 and Abstract). The solution composition prior to deposition is encompassed by the claimed dispersion. Furthermore, the reference defines the “unwrapped double helix” as destroyed hydrogen bonding of the double helix in the presence of NaOH, which is illustrated by the hyperchromatic shift (page 41-42).

Regarding Claim 22, Buzaneva et al disclose the complex wherein the nucleic acid is DNA (Abstract).

Regarding Claim 23, Buzaneva et al disclose the complex wherein the nucleic acid is synthetic and/or isolated from nature (page 42, left column).

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Regarding Claim 27, Buzaneva et al disclose the complex wherein the nucleic acid is metalized (i.e. Pt/Ir tip-DNA, page 42, left column).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matyshevskaya et al (Mat. Sci. Eng. C, August, 2001, 15:249-252) in view of Massey et al (U.S. Patent No. 5,866,434, issued 2 February 1999).

Regarding Claim 24, Matyshevskaya et al disclose a complex comprising unfunctionalized carbon nanotubes and single stranded nucleic acid (i.e. unwrapped double helix) wherein the complex is dispersed in solution prior to droplet deposition (page 249, last paragraph and Abstract). Matyshevskaya et al is silent regarding the length of the nucleic acid. However, Massey et al teach a similar complex of nucleic acids and nanotubes (fibril) wherein the nucleic acids are single stranded and 70 nucleotides (Column 45, lines 13-20) whereby the complexed nucleic acid is useful for target binding. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the 70 basepair nucleic acid of Massey et al to the nucleic acid of Matyshevskaya et al. One of ordinary skill in the art would have been motivated to do so for the obvious benefit of using the complex for target binding and analysis as taught by Massey et al (Example 6).

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7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

8. No claim is allowed.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

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Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.



BJ Forman, Ph.D.
Primary Examiner
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July 27, 2007